

# In what ways may disagreement aid the pursuit of knowledge in the natural and human sciences?

## Remember

- What kind of disagreements can there be?
- What other effects can disagreements have?

## Brainstorm

### Different kinds of disagreements

- **Disagreement in a complete theory or belief/explanation of a phenomenon**  
(ex. Darwin's theory of evolution, the Big Bang theory, Pangea theory, explanation of human behaviors in psychology and sociology, global warming, theories on cells)
- **Disagreement on how to prove a theory/ the method of approach to take**  
(ex. induction vs. deduction, calculating the change in enthalpy through different mechanisms and different reactions, how to study behaviors in baby to understand what they are thinking of)
- **Disagreement in models that are supposed to act as aids to explain phenomena**  
(ex. the atom model, economic models -> neoclassical vs. Keynesian models)
- **Disagreement in the effects of scientific advances**  
(ex. benefits of vaccination, the types of carcinogenic materials, if technology hinders or aids the communication between people)
- **Disagreement in setting standards in human and natural sciences**  
(ex. using real GDP to represent wealth (well being) of a country vs. using HDI to represent the well being of each individual in a country, setting a standard in psychology of %normal+behavior, generalizing types of reaction, generalizing the basic form of life -> are cells or viruses the smallest units of life?)

## Key terms to define

- *in what ways* -> how
- *disagreement* -> different points of view on a particular situation, controversies
- *aid* -> help, although this does not mean that advancement is completely reliant on disagreements
- *pursuit of knowledge* -> finding knowledge, knowledge is constantly progressing and changing, we're not at the truth yet, but we're trying to get as close to the truth as possible

## Assumptions

- the question assumes that disagreement does aid the pursuit of knowledge in the natural and human sciences
- I am assuming that there are different types of disagreements that can occur in the natural and human sciences (there are distinct categories)

## Overall summary

- Disagreements in the natural and human sciences aid the pursuit of knowledge by giving us several different explanations for things / methods to follow. This enables us to choose the better option and thus aids in the pursuit of knowledge
- Disagreements can also be used to enhance our understanding by comparing different points of view both of which may contain an element of truth

## Supporting (Point 1)

- Disagreement in a theory or belief
- Disagreement in the explanation of a phenomenon
- Disagreement in explanations give us interpretations for a situation, so we have an option to choose the better interpretation that is more likely to lead us to a specific knowledge

## Evidence (Point 1)

- Theories on the origin of cells -> different theories over the centuries, people used to think that all life came spontaneously until they understood the concept of cells (Natural Sciences)
- Theory of evolution -> Darwin's theory of evolution (Natural Sciences)
- Theories on global warming -> not all scientists agree with explanations of global warming (Natural Sciences)
- Different explanations for a particular human behavior in psychology and sociology -> in Hamlet, Freud's interpretation of Hamlet's intentions as being related to his love for his mother vs. other interpretations of Hamlet's intentions (Human Science)
- Different explanations for changes in consumer behavior in economics -> why do consumers purchase less of a certain good than another good? (Human Science)

**Comment [Kev1]:** A good attempt to broaden out the question by remember to consider the different ways in which people might disagree and the different ways in which these disagreements might help us.

The second point here, about disagreements that don't aid in the pursuit of knowledge is worth bearing in mind but not much time should be spent on this

**Comment [Kev2]:** There is a lovely series of ideas here that are all based around the key term in the question which in this case is Disagreements

Brainstorming like this at the start of your essay not only helps you to think of a more varied, rich and convincing answer but it can also help you structure your essay as there are now clearly five different ideas that can be explored in (at least) five different paragraphs.

**Comment [Kev3]:** Some good, clear definitions if although these don't necessarily have to be outlined verbatim in your introduction if they can just be things that you bear in mind as you work through your essay.

**Comment [Kev4]:** This is good, although could be fleshed out a little more so that it more fully summarises all of the different points that were made in the brainstorm.

**Comment [Kev5]:** This is in some ways the most obvious disagreement to explore, so it makes sense to start with it if but at the moment this plan only tells me what the disagreement is when it should be about how this kind of disagreement helps us pursue knowledge.

**Comment [Kev6]:** Generally be wary of phrases like this if it is often an oversimplification. Naming a particular scientist who suggested this view would be much better.

**Comment [Kev7]:** A specific example of the experiments used to demonstrate this would be good

**Comment [Kev8]:** This is a sound example if although a less obvious one would show that the student was thinking for themselves a little more

**Comment [Kev9]:** Once again, specific examples / names would make this more convincing.

**Comment [Kev10]:** It is often unconvincing when characters from literature are used to prove scientific points if even in the HS.

**Comment [Kev11]:** In general there are some good examples here all of which could potentially be used to support the point if however, there are too many and so you would have to choose the best one or two to focus on

### Supporting (Point 2)

- Disagreement on how to prove a theory
- Disagreement on the method of approach in proving theories
- Using different methods to approach knowledge is able to increase the reliability of the method of approach and the reliability of the knowledge that is being found when the results are consistent using different methods of approach

**Comment [Kev12]:** This is better than point 1 because the student makes it clear how this kind of disagreement aids us in the pursuit of knowledge although it would have been good to have actually used this phrase.

### Evidence (Point 2)

- Calculating the change in enthalpy of a reaction using different mechanisms in a science lab at school (natural sciences)
- Using different methods to study behaviors of a baby and to understand what they are thinking of (human science)

**Comment [Kev13]:** Good use of a formal yet personal example.

**Comment [Kev14]:** Sometimes more detail is needed about what methods exactly and what about the baby are studying?

### Challenge/Counterclaim (Point 2)

Not all methods of approach may have the same results

**Comment [Kev15]:** Remember that this has to link back to the overall point that you are trying to make ... in this case there needs to be some reference to how this helps (or does not help) us in the pursuit of knowledge.

### Response (Point 2)

If the methods do not have the same results, then scientists should use the most occurring result or try obtaining results again using the same method

**Comment [Kev16]:** At this point the candidate has made quite a common mistake and has tried to solve the counterclaim by explaining what we should do when we get different answers from different methods. However, what they really need to do here is talk about how different findings can still help us pursue knowledge. If there is no way to argue this then the candidate needs to change their response and acknowledge that there are some disagreements that don't help us pursue knowledge.

### Supporting (Point 3)

Disagreement in models that are supposed to act as aids when explaining phenomena

### Evidence (Point 3)

- Building houses out of lego, my brother and I would end up with completely different models of a house (personal example)
- Different models of the atom over the centuries -> Bohr Rutherford model, electron cloud model (natural science)

**Comment [Kev17]:** This could be an interesting point if the candidate has to make it clear how it is different to Point 1 and (more importantly) the candidate needs to make it clear how this helps us pursue knowledge (or not).

### Challenge/Counterclaim (Point 3)

Some models cannot be disagreed with, e.g. the model of the supply and demand curves are the fundamental models in economics. Although there may be different opinions on the determinants of supply or demand, the representation of the effects of the determinants of supply or demand through the supply or demand curve is used commonly amongst economists.

**Comment [Kev18]:** The candidate is trying to include a personal example but this is not a particularly convincing one. It sounds a little made up and it is also not really the right kind of model.

### Response (Point 3)

Disagreements are not necessarily the only aid in our pursuit of knowledge. Agreements can be made when scientists are as close to the knowledge as possible, and when theories are recognized to be correct, e.g. the double helix model of DNA is a recognized model, and will be adjusted if scientists were to realize that there are faults in this representation of DNA (natural sciences)

**Comment [Kev19]:** The candidate is trying too hard to find a counterclaim, this does not really seem to be a convincing claim. Is it really true that there are some models that can't be disagreed with?

### Supporting (Point 4)

Disagreement in the effects (benefits or dangers) of scientific advancements

### Evidence (Point 4)

- Benefits of vaccination (natural science)
- Benefits of formula milk vs. breast feeding (natural science)
- Does technology hinder or aid the communication between people? (human science)

**Comment [Kev20]:** It's not entirely clear how this is a response to the counterclaim

### Challenge/Counterclaim (Point 4)

If there are disagreements, how would we know what is theory is closer to the truth of the effects of scientific advancements?

**Comment [Kev21]:** Phrases like this are problematic about how do we know that we are as close to knowledge as possible?

### Response (Point 4)

Usually the theory that has a greater popularity amongst scientists becomes the more accepted theory if more scientists agree on the effects, equivalent to more researches indicating similar effects

**Comment [Kev22]:** Again the link back to the question needs to be clear about how does this help us pursue knowledge?

**Comment [Kev23]:** This seems very similar to Counterclaim 2

**Comment [Kev24]:** Again the focus on the question has been lost about this is about how theories become accepted which is not necessarily the same thing as helping us pursue knowledge

### Supporting (Point 5)

Disagreement in setting standards in human and natural sciences. Standards are used as general guidelines in the human and natural sciences and there might be several different opinions on the standards set in certain areas of the human and natural sciences

### Evidence (Point 5)

- Using real GDP to represent the wealth (wellbeing) of a country vs. using HDI to represent the living conditions of a country in economics (human sciences)
- Setting a standard for what can be considered as %normal behavior+in psychology (human sciences)
- Generalizing the basic form of life -> are cells or viruses the smallest units of life? (natural science)

### Challenge/Counterclaim (Point 5)

Generalizations and standards are sometimes necessary when making assumptions in the pursuit of knowledge, and so there cannot be disagreements on the standard

### Response (Point 5)

Different types of standards and generalizations can be combined to make an assumption (ex. If we were to determine the well-being of a country, we should not only consider real GDP but also HDI, life expectancy, mortality rate, etc.)

**Comment [Kev25]:** Potentially a good idea, this is definitely a different kind of disagreement that we can have if although exactly what is meant by standards could be made clear. Something like what counts as ethical / unethical experiments would be good.

In one sense these disagreements paralyse us because we can't carry out further research. But often the disagreement brings an issue out into the open and then old prejudices about what we should / shouldn't can be explored and challenged in a new light.

**Comment [Kev26]:** Once again, though, there is considerable vagueness here.

**Comment [Kev27]:** The second of these seems to me the most interesting as the other two actually seem to be quite similar to issues that have been discussed earlier.

**Comment [Kev28]:** Again this seems like the candidate is trying to hard to find a counterclaim because this one doesn't seem convincing at all if surely we know that there can be disagreements about standards.

**Comment [Kev29]:** Again the candidate seems to have become a little confused and they are trying to tell us how to solve the problem that occurs when we have disagreements over standards.

However, if we do that then there is no disagreement anymore and so the example would no longer be of any use because this question is meant to be about what happens when we **do** have disagreements.

So what the candidate should do is instead let the disagreement exist but instead tell me how the existence of this disagreement helps us to pursue knowledge. This is a very common mistake that is often made by students so keep your eyes open for it.